ROHM AND HAAS

ROHM AND HAAS COMPANY
100 INDEPENDENCE MALL WEST PHILADELPHIA PA 19106-2399 USA
TELEPHONE: (215) 592-3000 FAX (215) 592-3377

Jeffrey C. Wyant
Chief Regulatory Counsel
Tele.: (215) 592-6782
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December 8, 2006

Via Hand Delivery

Harry R. Steinmetz (3HS62)
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Re: Required Submission of Information
Safety Light Corporation Site
Bloomsburg, Pennsylvania

Dear Mr. Steinmetz:

Enclosed please find the response of Rohm and Haas Company to the November 3, 2006, 104(e) information request issued by USEPA to Rohm and Haas and other parties in the captioned matter. As you will see from the enclosed response, the only known return by Rohm and Haas of any kind to Safety Light (or its earlier designations) was the May 1962 return of a 100 millicurie source of Kryton 85 to USRC (a Safety Light related entity) and a possible, but not confirmed in any records or recollection, return of a spent 45 microcurie source of Kryton 85 to USRC.

I will be the Rohm and Haas contact in this matter. Feel free to contact me if you have any questions regarding the enclosed response.

Very truly yours,

Jeffrey C. Wyant
Chief Regulatory Counsel

JCW/jcl
Enclosure

1. Describe in detail the business relationship between Rohm and Haas and Safety Light.

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing employees likely to have relevant information and reviewing available documentation, Rohm and Haas only has been able to discover six business transactions with a Safety Light affiliated company. In its research, Rohm and Haas looked for transactions with Safety Light and its affiliated companies including U.S. Radium , Line Ridge Industries, USR Industries, USR Metals, Metreal and Isolite. Rohm and Haas discovered six transactions with U.S. Radium (USRC). Of those six transactions, only one involved a shipment of radioactive materials to Safety Light. These six transactions can be summarized as follows:

- In April, 1960, Rohm and Haas acquired a 100 millicuries source of ^{85}Kr and a selective ion generator from USRC under AEC license 37-6362-1. See exhibits A, B, C, D, E.
- In May, 1962, Rohm and Haas returned the above 100 millicuries source of ^{85}Kr and the selective ion generator to USRC. See exhibits A, F. This is the only transaction which involves a shipment to USRC.
- In July, 1963, Rohm and Haas acquired a 45 microcurie source of ^{85}Kr and a selective ion generator from USRC under USRC's general license GL-117. See exhibits A, G. (Rohm and Haas has no record of returning this 45 microcurie source to USRC or any other entity. Normal practice, however, would have been for Rohm and Haas to return the spent source of ^{85}Kr to the vendor, in this case USRC. We are still reviewing documents and if we are able to find any record of returning this 45 microcurie source of ^{85}Kr, we will forward it to EPA. In 2005, Rohm and Haas attempted to contact USRC to inquire about returning the selective ion generator. Upon learning that USRC was a Superfund site, Rohm and Haas instead chose to dispose of the ion generator through Chase Environmental, a non-USRC entity.)
- In December 1964, Rohm and Haas acquired from Mine Safety Appliances a "Billionaire" detection instrument which included a two 600 microcurie sealed sources of USRC ^{241}Am. Exhibit H, I. (The two sources of ^{241}Am were subsequently disposed of through Radiowaste, a non-USRC entity, in September 1978. See Exhibit J.)
- In 1964, Rohm and Haas acquired from Barber-Coleman Company, a non-USRC entity, an electron-capture gas chromatograph detector which included a 20 millicurie source of ^{90}Sr from USRC. See exhibits J, K, L. (The ^{90}Sr was sent to Radiowaste, a non-USRC entity, in 1976. See exhibits J, L.)
- In July, 1960, Rohm and Haas acquired from USRC an Ionostat instrument which included a 30 microcurie source of USRC ^{226}Ra. See exhibits M, N. (Both the

Ionostat unit and the ^{226}Ra source were disposed of through Chase Environmental Group, a non-USRC entity, in March, 2002. See exhibit M.)

2. Did Rohm and Haas ever transport and/or broker hazardous substances and/or radioactive waste or other wastes to the Site (including, but not limited to, spent or expired "EXIT" signs or other devices, and the like), for disposal or reclamation?

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

Please see response to Question 1 for Rohm and Haas' knowledge of business transactions with USRC. To the best of its current knowledge, Rohm and Haas never acted as a transporter or broker for materials going to the Site.

3. If you answered "yes" to Question 2, please answer the following questions:

a. Provide the name, current address (or most recent address available), telephone number, and contact person for each customer/generator/transporter for which you transported/brokered hazardous substances, radioactive waste or other wastes.

b. Provide the time period during which you transported/brokered each customer/generator/transporter's hazardous substances, radioactive waste or other wastes.

c. For each customer/generator/transporter for which you transported/brokered hazardous substances, radioactive waste or other wastes, provide:

i. the entity which received the hazardous substances, radioactive waste or other wastes (i.e., U.S. Radium, Lime Ridge Industries, USR Industries, USR Metals, Metreal, Isolite);

ii. the type of hazardous substances, radioactive waste or other wastes that was disposed/reclaimed;

iii. the amount of hazardous substances, radioactive waste of other wastes transported/brokered to the Site by you;

iv. the dates of the pickup/delivery of the hazardous substances, radioactive waste or other wastes;

v. all personal and/or internal company documents and correspondence regarding the type and amount of hazardous substances, radioactive waste or other wastes, dates transported/brokered to the Site, and transactions

with US Radium, Lime Ridge Industries, USE Industries, RSR Metals, Metral or Isolite;

vi. the name, title, areas of responsibility, current (or most recent) addresses, and telephone numbers of other parties that have documentation or information pertaining to the transportation/disposal of hazardous substances, radioactive waste or other wastes at the Site.

4. Did Rohm and Haas ever generate radioactive wastes or other wastes that were disposed of or reclaimed by U.S. Radium, Lime Ridge Industries, USR Industries, USR Metals, Metreal or Isolite at the Site?

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

Rohm and Haas returned a 100 millicuries source of ^{85}Kr to USRC in May, 1962. Rohm and Haas may have also returned a spent 45 microcurie source of ^{85}Kr to USRC. Rohm and Haas has no record of returning this 45 microcurie source to USRC or any other entity. Normal practice, however, would have been for Rohm and Haas to return the spent source of ^{85}Kr to the vendor, in this case USRC. Please see Response to Question 1 above for more details.

5. If you answered "yes" to Question 4, please address the following issues:

a. Please provide the following information regarding all wastes and by-products produced by your company during the period 1945 to the present:

i. the nature of radioactive waste or other wastes, hazardous substances, and/or by-products used, including their chemical content, characteristics, and physical state (i.e., liquid, solid, gas, or in the form of contaminated rags, cups, containers). Provide chemical analyses and Material Safety Data Sheets ('MSDSs"). If these analyses are not available for the period 1977-1991, submit analyses for the time period closest to these dates and describe, in detail, any changes in the process(es) in which radioactive waste or other wastes were produced that would affect the chemical analyses;

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing knowledgeable employees and reviewing relevant documentation, Rohm and Haas' current knowledge of the materials disposed of at the Site is reflected in the response and exhibits to Question 1.

ii. the annual quantity of radioactive waste or other wastes, hazardous substances and/or by-products used or generated;

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing knowledgeable employees and reviewing relevant documentation, Rohm and Haas believes it only sent a single return of a 100 millicuries source of ^{85}Kr to the Site.

iii. the process(es) in which radioactive waste or other wastes, hazardous substances, and/or by-products used or generated;

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing knowledgeable employees and reviewing relevant documentation, Rohm and Haas' current knowledge of the materials disposed of at the Site is reflected in the response and exhibits to Question 1.

iv. the types of containers used to treat, store, or dispose of radioactive waste or there wastes, hazardous substances, and/or by-products; and

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing knowledgeable employees and reviewing relevant documentation, Rohm and Haas' current knowledge of the materials disposed of at the Site is reflected in the response and exhibits to Question 1.

v. the method of treatment and/or disposal of the above.

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

After interviewing knowledgeable employees and reviewing relevant documentation, Rohm and Haas' current knowledge of the materials disposed of at the Site is reflected in the response and exhibits to Question 1.

b. Provide the names, titles, areas of responsibility, addresses, and telephone numbers of all persons, including you, who, during the period 1945 to the present, may have:

i. Disposed of or treated radioactive or hazardous materials at the Site;

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

Respondent is not aware of any third party who may have disposed, treated, or arranged for the disposal of radioactive or hazardous materials at the Site, or arranged for transportation of radioactive or hazardous materials at the Site. As to the Respondent, a variety of current and former employees potentially may have been involved in the May 1962 return to the Site. To the extent this Question seeks information about Rohm and Haas' radiological waste disposal practices, the person most knowledgeable is:

Dr. Alan M. Rothman
Radiation Safety Officer
Rohm and Haas Company
Spring House Technical Center
727 Norristown Road
Spring House, PA 19477
215-641-7229

ii. Arranged for the disposal or treatment of radioactive or hazardous materials at the Site; and

Please see response to Question 5 (b) (i) above.

iii. Arranged for the transportation of radioactive or hazardous materials to the Site (either directly or through transshipment points) for disposal of treatment.

Please see response to Question 5 (b) (i) above.

c. If your response to the above includes the contracting of a hauler or transporter to transport and/or dispose of wastes, explain these arrangements and provide documentation confirming the nature of those transactions. Please identify:

i. The persons with whom you, or other such person, made such arrangements;

ii. Every date on which such arrangements took place;

iii. For each transaction, the nature and quantity of material, including its chemical content, characteristics, physical state (i.e., liquid, solid), and

the process for which the substance was used or the process that generated the substance;

iv. The precise locations at which each material was disposed or treated at the Site;

v. The persons who selected the Site as the place at which materials were disposed or treated;

vi. The final disposition of each material involved in such transactions; and

vii. The names of employees, officers, owners, and agents for each transporter.

d. For each and every instance in which you/your company arranged for disposal or treatment of material at the Site, identify:

i. The quantity (number of loads, gallons, drums) of materials that were used, treated, transported, disposed, or otherwise handled by you; and

Please see the Response to Question 1 above.

ii. Any billing information and documents (invoices, trip tickets, manifests) in your possession regarding arrangement made with your company to generate, treat, store, transport, or dispose of materials at the Site.

Please see the documents provided as exhibits in response to Question 1, in particular exhibits A, B, C, F.

e. Provide the names, titles, and areas of responsibility of any persons, including all Rohm and Haas employees, present and former, who are knowledgeable of the waste disposal practices of your company during the period 1945 to the present. Include current addresses and dates of birth for former employees.

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

A variety of current and former employees may potentially have such knowledge. To the extent this Question seeks information about Rohm and Haas' radiological waste disposal practices, the person most knowledgeable is:

Dr. Alan Rothman
Radiation Safety Officer
Rohm and Haas Company
Spring House Technical Center
727 Norristown Road
Spring House, PA 19477
215-641-7229

f. Describe any permits or applications and any correspondence between Rohm and Haas and any regulatory agencies regarding materials transported to or disposed of at the Site.

Please see the Response to Question 1, including the documents provided as exhibits, in particular exhibits A, B, C, D, E..

g. Provide copies of any correspondence between Rohm and Haas and any third part regarding materials transported or disposed of at the Site.

Rohm and Haas is not aware of such correspondence.

h. Provide copies of any correspondence between Rohm and Haas and any third party regarding materials transported or disposed of at the Site.

Rohm and Haas is not aware of such correspondence.

i. Provide the identities of all predecessor-in-interest who, during the period of 1945 to the present, transported to or stored, treated, or otherwise disposed of any materials at the Site and describe in detail the nature of your predecessor-in-interest's business.

Rohm and Haas is not aware of such predecessors-in-interest.

j. Provide the name, title, address, and telephone number of the person answering these questions on behalf of the respondent

The Response to these Questions was assembled in the Rohm and Haas Law Department under the supervision of:

Jeffrey C. Wyant
Chief Regulatory Counsel
Rohm and Haas Company
100 Independence Mall West
Philadelphia, PA 19106
215.592.6782

k. For each question, provide the name, title, area of responsibility, current address, and telephone number of all persons consulted in preparation of the answers, or who supplied documents reviewed or relied upon in the course of preparing your answers.

Respondent objects to this Question as overly broad and unduly burdensome. Subject to and without waiving this objection, Respondent states as follows:

A variety of current employees were consulted and provided documents for review. The primary source for information and documents used in preparing this Response was :

Dr. Alan Rothman
Radiation Safety Officer
Rohm and Haas Company
Spring House Technical Center
727 Norristown Road
Spring House, PA 19477
215-641-7229

6. If you have reason to believe there may be person able to provide more detailed or complete responses to any question contained herein, or who may be able to provide additional responsive documents, provide the names, titles, areas of responsibility, current addresses, and telephone numbers of such persons as well as additional information or documents they may have.

Rohm and Haas is not aware of such person or persons.

7. For each and every question contained herein, if information or documents responsive to the Information Request are not in your possession, custody, or control, then provide the names, titles, areas of responsibility, current addresses, and telephone numbers of the persons from whom such information or documents may be obtained.

Rohm and Haas is not aware of any such documents.

8. If you have any other information about other party(ies) who may have information that may assist the Agency in its investigation of the Site, or who may be responsible for the generation of, transportation to, or release of contamination at the Site, please provide such information. The information you provide in response to this request should include the party's name, address, type of business, and the reasons why you believe the party may have contributed to the contamination at the Site or may have information regarding the Site.

Rohm and Haas is not aware of such party or parties.

9. If any of the documents solicited in this information request are no longer available, please indicate the reason why they are no longer available. If pertinent records or documents were destroyed or are missing, provide us with the following:

Rohm and Haas is not aware of any such documents.

a. your document retention policy.

b. A description of how the records were destroyed (burned, archived, trashed, etc.) and the approximate date of destruction.

c. A description of the type of information that would have been contained in the documents; and

d. The name, job title and most current address known by you of the person(s) who would have produced these documents; the person(s) who would have been responsible for the retention of these documents; and the person(s) who would have been responsible for the destruction of these documents.

Certification of an Appropriately Authorized Official

I am the current Radiation Safety Officer for Rohm and Haas Company. I have examined and am familiar with the information contained in this Response, and this Response is, to the best of my knowledge and belief, true, accurate and complete.

Alan M. Rothman

Dr. Alan Rothman
Radiation Safety Officer
Rohm and Haas Company
Spring House Technical Center
727 Norristown Road
Spring House, PA 19477
215-641-7229

Date: December 7, 2006

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit A

Washington Sq
Phila., Pa.

Kr 8

Rohm & Haas Co. (Richmond St., Phila. Pa.)

AEC license #37-6362-1 (D62) dtd 4/21/60 Expires 4-30-62

covers 10 sources not to exceed 100 mc/source

1960

4/28/60 1 Isotopes Kr 85 source in ion generator. USRC # 10.0 mc.

BT 92167. C.O. # L-19533 contains 100 mc. 38691.

Rets 5/or for disposal.

Disposal USR 6/62

5/31/62 Disposal of the above USRC

BL05408. C.O. 2-59111 Ion generator. #38691.

Shipped under USRC GL 117.

1963

7/29/63 1 — Selectron Ion Generator 45.0 mc.

BL061203. Model S16-250-14F.

C.O. 2-81220 Ser. No. 310; USRC #4700.

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit B

Page 1 of 1 Pages

U. S. ATOMIC ENERGY COMMISSION

Copy to be For Your Files

BYPRODUCT MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Name: Rohm & Haas Company Production Department	3. License number: 37-6362-1 (D62)
2. Address: 5000 Richmond Street Philadelphia 37, Pennsylvania	4. Expiration date: April 30, 1962
	5. Reference No.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may posses at any one time.
Krypton 85	A. Sealed sources (U. S. Radium Model LAB-644-1)	A. Ten sources not to exceed 100 millicuries per source.

9. Authorized use

To be used as static eliminators in screening equipment.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

11. This licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."

12. Byproduct material shall be used by, or under the direct supervision of, Edward Sioma or William Lyman.

13. Installation, relocation, replacement, initial radiation survey, and removal for disposal of sealed sources shall be performed by the U. S. Radium Corporation or other persons specifically licensed by the Commission to perform such services.

Date: April 21, 1960

For the U. S. Atomic Energy Commission

by James R. Mann

Division of Licensing and Regulation
Washington 25, D. C.

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit C

W. Lyman

Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved
Budget Bureau No. 38-R027.4

INSTRUCTIONS.–Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Rohm & Haas Company
5000 Richmond Street
Philadelphia 37, Pa.

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Production Department

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

37-1665-1, 37-1665-2

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Mr. Edward Sloan

5. RADIATION PROTECTION OFFICER *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

Dr. William Lyman

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

1000 MC Kr^{85}
in 10 sources
100 MC each.

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

Sealed source contained in sheet metal housing per
Rohm & Haas dwg. 35961. Spec. No. 1

Housing per NRC sketch attached
Source No. 36691 - positioned as per NRC sketch -
100 MC content

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

To eliminate or reduce static electricity associated with the screening of organic metallic salt powders in the equipment described by R&H spec. No.1 35961

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary.)

8. TYPE OF TRAINING	E. Blum WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	Course work; Univ. of Rochester	1 yr.	Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	" " "	1 "	Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " "	1 "	Yes No	Yes No
d. Biological effects of radiation	Univ. Rochester-Atomic Energy Project	7 "	Yes No	Yes No

9. EXPERIENCE WITH RADIATION. (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Pu	micrograms	Univ. of Rochester	7 yrs.	Determination of Biological Effects
(Exp for W.R. Lyman, Please refer to application for License No.				37-1665-1)

10. RADIATION DETECTION INSTRUMENTS. (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
1. Survey Meter, Nuclear Chicago Model D612	1	β,	0.2,2.0, 20.0 mr/hr full scale	1.4 mg/cm²	Monitoring, Surveying
2. Survey Meter, Victoreen Co. of Am. 1B-25	1	β,	0.25,2.5, 25.0 mr/hr	1.4 mg/cm²	" "
3. G.M. Victoreen 611	1	β,	.05-25mr/hr	not specified	" "

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

Calibrated each day when used, using source supplied with instrument No. 1

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. (For film badges, specify method of calibrating and processing, or name of supplier.)

None

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Applicant named in item 1

Date _____ By: _____

Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction

GPO - 87 407 3

13. None. Laboratory facilities described in application for License No. 37-1665-1 are available if needed.

14. No leak testing protection. R. Sioma and W.R. Lynam are responsible for other aspects of radiation protection. The supplier will be engaged for servicing, maintenance and repair of the source as needed.

15. Radiological Service Co., Valley Stream, N.Y.

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit D

Form AEC-313 (5-58)	ATOMIC ENERGY COMMISSION **APPLICATION FOR BYPRODUCT MATERIAL LICENSE**	Form approved. Budget Bureau No. 38-R027.4.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Rohm & Haas Co.
5000 Richmond St.
Philadelphia 37, Pa.

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Production Department

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

37-4368-1 Renewal
(368)

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Edward Sloma
William R. Lyman

5. RADIATION PROTECTION OFFICER *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

William R. Lyman

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

Krypton 85

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

Sealed sources (U. S. Radium Model LAB-6kk-1)
Ten sources not to exceed 100 millicuries per source

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

To be used as static eliminators in screening equipment.

(Continued on reverse side)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

9. EXPERIENCE WITH RADIATION. *(Actual use of radioisotopes or equivalent experience.)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

10. RADIATION DETECTION INSTRUMENTS. *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS *(Include make and model number of each)*	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE *(mr/hr)*	WINDOW THICKNESS *(mg/cm²)*	USE *(Monitoring, surveying, measuring)*

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes No

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. *Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.*

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date March 29, 1962

Reiss & Rose Company
Applicant named in Item 1

By: [signature]
Assistant Director of Research
Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U.S. GOVERNMENT PRINTING OFFICE : 1961 O—615963

Attachment to Application for Byproduct Material License

Item 15. Waste Disposal

Radiological Service Co., 811 West Merrick Road, Valley Stream, New York

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit E

May 29, 1963

Mr. A. R. Deschere

W. R. Lyman

Mr. Geisel
Dr. Levesque
Dr. Spell
Dr. Foster
Mr. Myers
Mr. Satterthwaite

Rohm & Haas Co. License No. 37-1665-1 for the Use of Radioisotopes

In anticipation of the opening of the new research laboratories at Springhouse and because of various changes in personnel assignments, an amendment to our AEC license was recently requested and has just been granted by the Atomic Energy Commission. The amended license permits the use of radioisotopes at the Springhouse laboratories as well as at Bridesburg, Bristol and the Newtown farm. While it is expected that most of the work with radioisotopes will continue to be done at Bristol there is one individual named in the license at each of the other locations who will be available for consultation, especially with regard to safety. These are as follows:

Bridesburg	Dr. George V. Foster
Springhouse	Mr. Warren L. Myers
Newtown	Mr. Stacy T. Satterthwaite

(Mr. Satterthwaite is located at Bristol but is in charge of work done with radioisotopes in Laboratory 11, including work at the farm.)

Copies of this license and of this most recent amendment are attached to your copy of this memorandum. The originals are filed by Mrs. Broomhead in Mr. Geisel's office.

There are two other licenses issued by the AEC to the Rohm and Haas Company as follows:

License No.	Isotope	Quantity	Individual Users
37-1665-2	Cobalt-60	1 millicurie	Mr. W. F. Bartoe
37-6362-1	Krypton-85	10 x 100 millicuries	Mr. Edward Sioma Dr. W. R. Lyman

License 37-1665-2 covers a sealed Co^{60} source used for testing instruments for the Bristol personnel shelter. License 37-6362-1 was obtained to permit trial of Krypton-85 sources in static elimination devices in the Bridesburg plant. These trials were not satisfactory and there the radioactive material was returned to the supplier.

I have also attached to your copy of this memorandum copies of forms submitted to the Pennsylvania Department of Health for registration of radioisotopes. This registration also includes radium which is not controlled by the AEC. Re-registration is required at 2 year intervals. Another form will be submitted covering the Springhouse laboratories when they are occupied.

W. R. Lyman

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit F

FORM WA-277
(5-61)

UNITED STATES
ATOMIC ENERGY COMMISSION
CERTIFICATE—DISPOSITION OF RADIOISOTOPES

LICENSEE (*Institution, firm, hospital, person, etc.*)	LICENSE NUMBER
Rohm & Haas Company	37-6362-1

ADDRESS

5000 Richmond Street
Philadelphia 37, Pa.

DEPARTMENT(S)

Production

INDIVIDUAL RADIOISOTOPE USER(S)

Edward Sioma
William Lyman

CERTIFICATION

The licensee and any individual executing this certification on behalf of the licensee certify that (check appropriate item(s) below):

☐ No byproduct materials have been procured and/or possessed by licensee.

OR

All byproduct materials procured and/or possessed by licensee under Byproduct Material License No. 37-6362-1 have been:

☒ (1) transferred to (*state name of institution, firm, hospital, person, etc.*)

U.S. Radium Corp., Morristown, N. J.

which has Byproduct Material License No. 37-30-2

☐ (2) disposed of by decay.

☐ (3) disposed of in compliance with the provisions of 10 CFR 20.

Remarks:

William R. Lyman
(*Signature of certifying official*)
(Radiation Safety Officer)

Date March 17, 1964

GPO 16—70881-1

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit G

6-27-68

SEALED RADIOACTIVE SOURCE

Isotope: Krypton - 85 Half-life: 10.27 years

Quantity: 45 μc as of Date: 7-63

Purchased from: U. S. Radium Corp.

Nature of Use: Selective Ion Generator

Serial No. of Source:

Instrument:

Model No.: SIG 250-1AF

Serial No.: H-1700

Location: Laboratory 48, Philadelphia Bldg. 60 E. Lionna

AEC License No.: General Mfg and sold by U.S. Radium under licens no GL-117

Pa. State Registered: ~~Yes~~ No - Unnecessary

Leak Test Requirement: None ~~semi-annual test required every 6 mos.~~

Test Date	Result	Test Date	Result

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit H

SEALED RADIOACTIVE SOURCE

Isotope: Americium 241 Half-life: 470 years

Quantity: 600 microcuries as of Date: December, 1964

Purchased from: Mine Safety Appliances

Nature of Use: Detection of Nickel Carbonyl in Air

Serial No. of Source: U.S. Rad. Co. 53289

Instrument: Billionaire

Model No.:

Serial No.: BLO 63265R

Location: 6-28-68 In storage cabinet room of 64-B, Bristol since April 1968.

AEC License No.: 37-1665-3

Pa. State Registered: Yes

Leak Test Requirement: 6 month intervals

Test Date	Result	Test Date	Result
12-3-68	< 0.005 μc		

Will recheck when taken from storage

4-27-70 < 0.005 μc S. Cope

4-27-70 Transf. to John Danos, L.48
Phila. Research Labs

4-2-71 < 0.005 μc S. Cope
Now in storage - Room 64B

SEALED RADIOACTIVE SOURCE

Isotope: Americium 241 Half-life: 470 years

Quantity: 600 microcuries as of Date: December, 1964

Purchased from: Mine Safety Appliances

Nature of Use: Detection of Nickel Carbonyl in Air

Serial No. of Source: U.S. Rad. Co. 53290

Instrument: Billionaire

Model No.:

Serial No.: BL063265R

Location: 6-28-68 In storage cabinet, roof of 64-B, Bristol since April 1968

AEC License No.: 37-1665-3

Pa. State Registered: Yes

Leak Test Requirement: 6 month intervals

Test Date	Result	Test Date	Result
12-3-68	< 0.005 μc		
Will recheck when taken from storage			
4-27-70	< 0.005 μc S. Cope		
4-27-70 Transf. to John Davis, L.48 Phila Research Labs.			
4-2-71	< 0.005 μc S. Cope		
Now in storage - Roof 64B			

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit I

Form AEC-313 (5-58)	ATOMIC ENERGY COMMISSION **APPLICATION FOR BYPRODUCT MATERIAL LICENSE**	Form approved. Budget Bureau No. 38-R027.3.

INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Bolm & Haas Co.
5000 Richmond Street
Philadelphia 37, Pa.

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*

Bolm & Haas Co.
Bristol, Pa.
and Spring House, Pa.

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

Research Department

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

37-1066-1
37-1066-2
37-1066-1 (amended)

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Rowland V. Scott

5. RADIATION PROTECTION OFFICER. *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

William R. Lynam

6. (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

Americium 241

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

Four (4) sealed sources
U. S. Radium Corporation
Model LAS 304-1A Rev. 2
600 microcuries per source

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

Sources will be used in Mine Safety Appliance Company "Billionaire" instrument for the detection of nickel carbonyl in air at concentrations of one part per billion or less. Each Billionaire instrument requires two sources. Air is monitored continuously in areas where nickel carbonyl is used for the protection of workers in such areas.

(Continued on reverse side)

Form AEC–313 (5-58) Page Two

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	(R.F. Scott) WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	St. Joseph's College, Phila.	1 sem.	Yes (No)	(Yes) No
b. Radioactivity measurement standardization and monitoring techniques and instruments	"	"	Yes (No)	(Yes) No
c. Mathematics and calculations basic to the use and measurement of radioactivity	"	"	Yes (No)	(Yes) No
d. Biological effects of radiation	"	"	Yes (No)	(Yes) No

9. EXPERIENCE WITH RADIATION. *(Actual use of radioisotopes or equivalent experience.)* (R.F. Scott)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
C^{14}	Very small	Univ. of Pa.	1-1/2 yrs.	Radiocarbon dating.
Ra^{226}	.75 mc	Rohm & Haas Co.	4 yrs.	Sealed sources in instruments.

10. RADIATION DETECTION INSTRUMENTS. *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm^2)	USE (Monitoring, surveying, measuring)
Survey Meter Victoreen Inst. Co. Model 631 (See supplemental sheets)	1		0.05, 0.25, 2.5, 25	Not specified (Tube 631-44)	Surveying

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

Calibrated by use of check source each day used.

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

Dosimeters (Bendix Model 862) will be used when sources are leak-tested at six-month intervals.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes (No) See separate sheet.

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See separate sheet.

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

Radiological Services Co., Philadelphia, Pa.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Date August 21, 1964

Rohm & Haas Co.
Applicant named in Item 1

By: A. R. Dietrich

Asst. Director of Research
Title of certifying official

WARNING.—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 568569

Application for Byproduct Material License
Information to Supplement Form AEC-313

Training

Mr. R. W. Scott - See form AEC-313.

Dr. W. R. Lyman

Six months on-the-job training under Dr. A. R. Weiss at Rohm & Haas. This included the synthesis of organic compounds labeled with tritium and carbon-14, radioactivity measurements and monitoring of working areas (1958).

Four weeks basic course in radioisotopes techniques, Oak Ridge Institute of Nuclear Studies, September 1958.

Experience with Radiation

Mr. R. W. Scott - See form AEC-313.

Dr. W. R. Lyman

Extensive experience in the synthesis of tritium-labeled and C^{14}-labeled compounds involving curie quantities of tritium and up to 35 millicuries of C^{14}, and the use of these materials in tracer applications.

Responsibility for radiological safety at Rohm & Haas Co. since 1959.

Radiation Detection Instruments

In addition to the instrument described on Form AEC-313 the following instruments are located at the Rohm & Haas Co., Bristol, Pa., and are available as needed.

2 Portable Survey Meters, Nuclear Chicago Model 2650 with Model 2661 Probe (End Window 1.5-2 mg/cm^2). Ranges 0.1, 0.3, 1.0, 3.0, 10, 30, 100 mr/hr (full scale).

1 Packard TriCarb Liquid Scintillation Spectrometer Model 314-EC (Expected to be replaced by Packard Model 3314).

1 Ionization Chamber with Vibrating Reed Electrometer. Applied Physics Corporation Model 31.

At the Rohm & Haas Co., Spring House, Pa., is located:

1 Portable Survey Meter, Nuclear Chicago Model 2612 with End Window Tube Model D-35 (1.4 mg/cm^2).
Ranges 0.2, 2.0, 20 mr/hr (full scale).

Facilities and Equipment

The locations where instruments containing sealed sources of americium will be located are standard laboratory facilities but with special provision for ventilation because of the toxic hazard from nickel carbonyl.

Radiation Protection Program

Each americium-241 source will be located in an ionization chamber within the "Billiosaire" instrument. Air from the laboratory will be taken into the ionization chamber continuously (for measurement of nickel carbonyl content) and will be vented to a laboratory hood. Hence, there should be no loss of radioactivity from the source to the laboratory.

At the time of installation the level of radiation at external surfaces of the instrument housing will be measured by survey meter. This level is expected to be below the permissible level for an unrestricted area as defined in paragraph 20.105 of Title 10 Chapter 1 Part 20 - Standards for Protection Against Radiation.

The instrument will bear a label in the specified red and yellow colors with the words "Caution, Radioactive Materials," the radiation symbol, and specifying the isotope, quantity and date.

At six month intervals each source will be tested for leakage. It is proposed to do this by wiping the entire surface of the source with a cotton swab moistened with water. The swab will be held by tweezers and the wiping will be done applying gentle pressure, but using care to prevent contact of the tweezers with the surface of the source. The inner surface of the ionization chamber will be wiped in the same way as a separate sample. Each cotton swab will be assayed for radioactivity by liquid scintillation counting, using the Packard TriCarb Liquid Scintillation Spectrometer Model 3314. In the absence of a standard sample of americium-241 for determination of counting efficiency, the efficiency will be assumed to be 50% at the optimum settings for count rate above background (about 20 cpm). A total activity of 0.005 microcurie (5,550 counts per minute at 50% efficiency) or more removed from any one source will indicate the necessity to replace that source.

Sources to be replaced will be returned to Mine Safety Appliances Corporation.

Leak testing will be done by R. W. Scott or W. R. Lyman. A pocket dosimeter will be used to measure possible exposure to radiation during this procedure. Records will be kept of the results of leak testing and dosimeter readings.

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit J

WRL Memo
No. 73-70

cc: RJ Goldman
WE Goode
VH Unger

Bristol Research, August 31, 1973

TO: Dr. A. M. Rothman

FROM: W. R. Lyman

SUBJECT: Sealed Radioactive Sources

Gradually during the past several years we have accumulated a number of sealed radioactive sources at Rohm and Haas locations in the Philadelphia area which have varying requirements with regard to licensing, leak testing and other safety requirements. I want to transfer to you the responsibility for seeing that safety requirements are met and that proper records are kept concerning them. The purpose of this memo is to summarize the present status as a basis for planning your activities in the future. Attached is a listing of sealed sources together with an indication of their requirements with regard to the following topics.

Licensing

Sources may be covered by specific licenses or by general license from the AEC. Radium sources are licensed by the Pa. Office of Radiological Health.

Safety

Most AEC licensed sources must be leak-tested at 6-month intervals, unless exempt, however, for one source a 3-year maximum interval is specified. Radium sources, unless exempt, must be leak-tested annually.

Krypton^{85} sources in the film plant do not require leak-testing but a semi-annual inspection of the shutter for proper mechanical operation is required.

Most safety activities we can attend to ourselves but in certain cases (source under general license) an outside service is required. It is still our responsibility to see that it is done.

Records

When leak tests are run by us the counting data should be recorded in a notebook. A log should be kept for each source wherein the source is identified by serial number, its use, location, etc. The date on which a test was made, the result and any action taken if the test was not satisfactory should be entered in the log. This log must be available to federal or state inspectors when inspections are made.

In cases where an outside service is engaged the report should be filed and the results entered in the logs for those sources.

Procedures

Separately, I will provide you with copies of procedures we use. In some cases we have specified these in applications for licenses for the sources in question.

W. R. Lyman

W. R. Lyman

WRL/mc
Att.

WRL Memo
No. 73-70

Attachment
i

RADIOACTIVE SEALED SOURCES

Americium 241

~~2 Sources 600 µCi each for use in Billionaire instrument~~
to detect nickel carbonyl in air
Laboratory 48 - E. Sioma - AEC License 37-1665-3
Leak test required at 6-mo interval when in use.
Currently in storage (since 4-2-71). Must be
tested before use. Discarded to radiowaste 9/19/78
Serial Nos. 53289, 53290

~~2 Sources~~ Formerly used in Kydex thickness gages.
~~Currently in storage awaiting disposition~~
Serial No. C-30 10 mCi
A-1007 25 mCi Transferred to LFE
These are under general AEC license. Outside leak tests at 6-mo intervals were required when in use.

Cesium 137

1 Source, 500 mCi Serial No. ~~1066~~ in Kay-Ray Liquid Slurry Density ~~Gage;~~ Phila. Plant, Mr. E. A. Pokora
General ~~License~~ AEC - Outside leak test required a ~~3-year~~ intervals. Due in Nov. 1974
Returned to Kay-Ray 2/11/77

Hydrogen 3 (tritium)

2 Sources, 250 mCi each, Serial Nos. 8092, 8094, in electron capture gas chromatograph detectors, R.J. Anderson, Lab 02, Bristol
AEC License 37-01665-01 - No leak tests are required but each detector in use must be protected by a device to prevent heating above 225°C

Krypton 85

1 Source, 45 µCi Serial No. H-1700
Laboratory 48 - E. Sioma - AEC General License
No leak test

3 Sources, (see below) in film thickness gages, Bristol Plant. AEC General License. No leak test. 6-mo shutter inspection (outside inspector).

Serial No.	Activity	Location	
~~53302~~	~~600 mCi~~	~~Bldg 123~~	sold to XCEL Corp.
~~084~~	~~190 mCi~~	~~" 134~~	returned to Taylor
~~089~~	~~190 mCi~~	~~" 123~~	sold to XCEL Corp.

Nickel 63

Sealed sources (see below) in electron capture gas chromatograph detectors. AEC License 37-01665-01 Leak tests are required at 6-mo intervals

1) Development Ag. Chemical Research, Bristol, W.R. Lyman

Serial No.	Activity	Instrument
111	15 mCi	Victoreen
127	"	"
133	"	"
142	"	"

2) Laboratory 02, Bristol, R. J. Anderson

67	8 mCi	Varian Aerograph
68	"	"
202	"	"
203	"	"
206	"	"
207	"	"
2614	14.5 mCi	Tracor
2617	"	"
2620	"	"
2622	"	"
2788	"	"
2790	"	"

3) ACIP Lab 13, Philadelphia, Karl Wallisch

H-0228	15 mCi	Hewlett-Packard

4) Laboratory 64, Philadelphia, R. Black

?	?	Hewlett-Packard (just received)

Radium 226

3 Sources, 20 µCi each, in Packard liquid scintillation spectrometers for calibration. (1, ACIP, Spring House; 2, Dev. Ag. Chem. Res., Bristol) Exempt from licensing and leak testing.

Radium 226 (continued)

2 Sources, 30 µCi each, in Ionostat Instrument Model H-1407, Serial No. 525. ACIP Lab 48, E. Sioma. Must leak test at ~~1-yr~~ 6 mo intervals License PA-176

1 Source, 6 1/4 µCi, in Alnor Inst. Co. "Dewpointer" Mechanical Dept., Phila. Plant, E. A. Pokora Must leak test at ~~1-yr~~ 6 mo intervals. License PA-176

Strontium 90 - Yttrium 90

1 Source, 20 mCi, Seral No. ~~LAB~~ 369, in electron capture gas chromatograph detector. Dev. Ag. Chem. Res., W. R. ~~Lyman~~
AEC License ~~37-~~01665-01. Leak test 6-mo intervals when in use. (This detector has not been used for several years. I will investigate possible disposal, WRL)

discarded to radiowaste 12/15/76

Cadmium-109

1 source 3 mCi in Columbia Scientific Inc. XRF metals analyzer.

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit K

Mr. A.R. Deschere
Dr. A. Spell

September 24, 1964

U. S. Atomic Energy Commission
Washington 25, D. C.

Attention: Isotopes Branch, Division
of Licensing and Regulation

Gentlemen:

I am writing to request that Byproduct Material License No. 37-1665-1 be amended as follows:

1) To permit the possession of two (2) Barber-Colman Company Model A4147 Detectors, each to contain a 30 millicurie strontium-90 sealed source U. S. Radium Corp. foil type LAB 369. The chemical form of the Sr^{90} is strontium sulfate. The active surface is covered by 0.001 inch of gold. These detectors will be used with a Barber-Colman gas chromatographic instrument Model 5000.

2) To add Mr. Charles F. Gordon and Dr. William J. McDermott to the list of individual users.

3) To remove Mr. Arthur L. Wolfe from the list of individual users.

The following information is in support of this request:

If the requested amendment is granted the instrument to be obtained will be used principally for the determination of pesticide residues on crops and in foods derived from them. This work will be under the supervision of Mr. C. F. Gordon.

Mr. Gordon is a graduate of LaSalle College, Philadelphia (B.A., 1948). He has also taken graduate study in chemistry including Chemistry 240 (Radiochemistry) at Saint Joseph's College, Philadelphia. This course includes basic principals of nuclear chemistry, radioactive decay, elementary particles, detection and measurement of radiation, health hazards, shielding problems and handling techniques, and application to chemical problems.

Mr. Gordon has had sixteen years of research experience including four years in U. S. government laboratories and ten years with the Rohm & Haas Company in the field of pesticide residue analysis.

Dr. William J. McDermott is a graduate of Saint Joseph's College, Philadelphia (B.S. 1931, M.S. 1932) and Fordham University, New York City (Ph.D. 1940). His career has included five years of full time teaching and twenty-four years of industrial research in the field of organic chemistry. Since 1953 he has taught in the evening division of Saint Joseph's College.

Dr. McDermott has had five months of on-the-job training with Dr. W. R. Lyman in the use of radioisotopes in chemical research. This has pertained primarily to the use of the isotopes covered by this license in the preparation of tagged organic compounds, the planning of projects utilizing these materials, counting measurements and radiological safety. He will supplement this training with course no. Bl.E. 131, Principles of Radioisotope Techniques, at Saint Joseph's College during the semester now starting. This course covers atomic structure, isotopes in general, errors of counting, modes and kinetics of decay, properties of radiation, calibration of radioactivity, instrumentation and sample preparation.

It is planned that Dr. McDermott will be concerned with providing labeled compounds needed for tracer studies and with the supervision of such projects.

Mr. Arthur L. Wolfe has recently resigned from employment with the Rohm & Haas Company.

Radiation Protection Pertaining to Sr^{90} Sources

The detector containing the Sr^{90} source and the room in which it is located will be posted as containing radioactive material. However, because the detectors will be operated at high temperatures which cause fading of colors request is made that condition 15 of AEC license 12-857-3, Am. 9, (to Barber-Colman Co.) be incorporated in this license. This condition states that in lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203 (a) (1) Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to apply the radiation caution symbol to detector cells and cell baths containing byproduct material and used in gas chromatography devices manufactured by the licensee by conspicuous etching or stamping without a color requirement.

The detectors will be used and maintained in accordance with instructions from the Barber-Colman Company. Any cell to be disposed of will be returned to the Barber-Colman Company, U.S. Radium Corporation or will be sent to the Radiological Service Co., Valley Stream, N.Y. for disposal. A test for leakage of radioactive material from the sealed source will be made at six-month intervals by the following procedure.

Wipe Test to Detect Leakage of Sr^{90}

This test will be done by an individual user named in the license. He will wear disposable rubber or polyethylene gloves while taking the samples. The procedure for taking the samples is as recommended by Barber-Colman Company.

1. Moisten a sheet of filter paper in clean water. Using only one side of it, wipe around the joint between the cell body and cap and around the opening in the bushing which holds the insulator in place. Fold the paper with the wiping surface inwards in a pad about 1.5 in. square, place it on a dry piece of filter paper and allow it to dry.

2. Remove the anode and its insulator and wipe the surfaces which were inside the cell with moist filter paper as in paragraph 1. Do not touch the internal surfaces with fingers or tools. Fold and dry the paper as specified above.

3. Repeat the operation in paragraph 2 using acetone instead of water for moistening the paper. Fold and dry it as before.

4. The three separate samples obtained will be assayed for radioactivity by liquid scintillation counting. A sample prepared in the same way but not used to wipe any surface will be used to determine the background count rate. A similar sample to which a known quantity of Sr^{90} activity has been added (from a standard solution) will be used to determine the proper instrument settings and the counting efficiency at those settings. It is anticipated that a count rate of 10 counts/min. above background can be detected readily and that counting efficiency will exceed 50%. This corresponds to a sensitivity of detection of 0.00001 microcurie. The instrument to be used is a Packard Tri-Carb Liquid Scintillation Spectrometer Model 3314.

Please let me know if any further information is needed.

Very truly yours,

ROHM & HAAS COMPANY

William R. Lyman
Radiation Safety Officer

WRL:ej

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit L

SEALED RADIOACTIVE SOURCE

Isotope: $Sr^{90} - Y^{90}$ Half-life: Sr^{90} 28 years; Y^{90} 64.2 hours

Quantity: 20 millicuries as of Date: 1964

Purchased from: Barber-Colman

Nature of Use: Electron Capture G.L.C. Detector

Serial No. of Source: U.S. Radium Mod LAB 369

Instrument: Gas Chromatograph

Model No.: 5002

Serial No.: 46K1087

Location: 64-D-301 A.C. Daftsios

AEC License No.: 37-1665-1

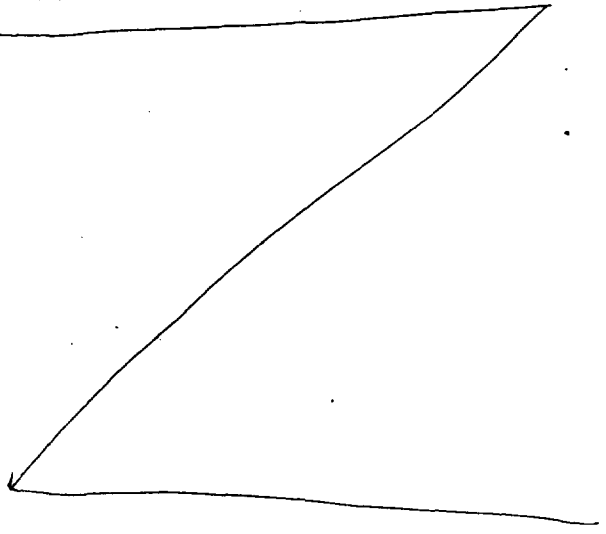
Pa. State Registered: Yes

Leak Test Requirement: 6 month intervals

Test Date	Result	Test Date	Result
6-13-68	No detectable leakage		
3-28-69	No detectable leakage		
10-24-69	No detectable leakage		

(Source is now in storage in cabinet on roof)

12/15/76 Discarded to radiowaste



Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit M

6-27-68

SEALED RADIOACTIVE SOURCE

Isotope: Radium 226 **Half-life:** 1622 years

Quantity: 30 microcuries **as of Date:** 7-11-60

Purchased from: U.S. Radium Corp.

Nature of Use:

Serial No. of Source:

Instrument: Ionostat

Model No.: N-1407

Serial No.: 525

Location: Laboratory 48, Bldg. 60, Philadelphia Labs Leon Walichi ex 2611

AEC License No.: Not required

Pa. State Registered: Yes

Leak Test Requirement: ~~Annual~~ 6 mos.

Test Date	Result
7-12-68	< .005 μc
9-10-69	< 0.005 μc
2-8-71	< 0.005 μc
8-29-72	< 0.005 μc
1-18-73	< 0.005 μc
1-23-74	< 0.005 μCi AMR
6-7-74	< 0.005 μci mac
12-20-74	< 0.005 μc. mac
6-13-75	< 0.005 μci AMR
12-3-75	< 0.005 μCi AMR
5/27/76	< 0.005 μCi AMR (1.3×10^{-4} μCi)
11/12/76	< 0.005 μCi AMR (6.7×10^{-6} μCi)
5/10/77	< 0.005 μCi AMR (2×10^{-5} μCi)
11/7/77	< 0.005 μCi AMR (2.2×10^{-6} μCi)
5/5/78	< 0.005 μCi AMR (.003 μCi)

Test Date	Result
11/2/78	0 μCi AMR
4/29/79	0 μCi AMR
5/27/80	0 μCi AMR
11/25/80	0 μCi AMR
5/21/81	0 μCi AMR
11/18/81	0 μCi AMR
7/19/82	0 μCi AMR
11/25/82	0 μCi AMR
5/23/83	0 μCi AMR
11/22/83	0 μCi AMR
5/24/84	0 μCi AMR
11/26/84	0 μCi AMR
6/18/85	0 μCi AMR
11/20/85	0 μCi AMR

Test Date	Result
3/19/86	0 μCi AMR
11/21/86	0 μCi AMR
5/19/87	0 μCi AMR
11/18/87	0 μCi AMR
5/16/88	0 μCi AMR
12/15/88	0 μCi AMR
5/16/89	0 μCi AMR
11/14/89	0 μCi AMR
5/25/90	0 μCi AMR
11/8/91	0 μCi AMR
5/7/92	0 μCi AMR
11/3/92	0 μCi AMR
5/7/93	0 μCi AMR
11/8/93	0 μCi AMR
5/9/94	0 μCi AMR
11/9/94	0 μCi AMR
11/10/95	0 μCi AMR
5/17/96	0 μCi AMR
12/2/96	0 uCi BAC
6/10/97	0 μCi AMR
12/9/97	0 uCi Bac
12/7/98	0 uCi Bac

Test Date	Result
9/28/99	0 μCi AMR
5/2/00	0 μCi AMR
10/31/00	0 μCi AMR
4/30/01	0 μCi AMR
10/29/01	0 μCi AMR
2/5/02	Discarded to Rad Waste AMR drum
3/18/02	Transferred to Chase Environmental Group (License # 201-605-90) for disposal. AMR Both sources and unit

Rohm and Haas' Response to 104(e) re Safety Light Corp. Site

Exhibit N

DISTRIBUTED BY UNITED STATES RADIUM CORPORATION
MORRISTOWN, NEW JERSEY

Description and Operating Instructions of

STATOMETER H 1407

D.B.Pat. No. 1 007 426

Description:

The Statometer H 1407 is used for measuring of the electric field intensity which occurs as a result of the electrostatic charging of insulated surfaces, such as plastics, textile, paper webs, etc.

Its accuracy is adapted to practical service conditions. Five measuring ranges and a corresponding choice of distances permit the measurement of both very small potentials of approximately 5 V and very high voltages of more than 100 kV and the establishment of their polarities by field intensity measurements.

The measuring is based on an ionisation chamber with a radium source of 10 µC. The alpha radiation of the source produces a constant doserate. The field to be measured drops into the open front of the ionisation chamber and accelerates the ions thus producing a current inside, which is proportional to the field intensity. The measuring range is extended by an iris diaphragm behind which an approximately spherical field is produced so that the decrease in intensity is approximately inversely proportional to the cubic of the diameter. The resulting ionisation current is amplified by an electrometer tube circuit and transferred to an indication instrument.

Operating Instructions:

Before the instrument is switched on make certain that the handle closed by a screw cap contains two dry-B-batteries of 1,5 V and that these are correctly polarised.

The left hand control knob is then turned to position "control" and the needle of the instrument should give deflection above the green mark. If the needle does not pass the green mark the battery is exhausted and will have to be replaced.

After this check up the switch is set to position "measuring" and the iris diaphragm attached to the tube is closed as far as possible. The needle of the instrument is then adjusted to the centre of the inner scale by turning the right hand knob right or left respectively.

The STATOMETER is now ready for service permitting the measuring range to be adjusted by the tube control. The values of the knob which changes the opening of the iris diaphragm have to be multiplied by the values shown by the meter. For instance in the case of very small field intensity, the iris diaphragm should be set to position 1; then the field intensity can be read direct in V/cm from the inner scale of the meter.

The surface charge of the object to be measured is positive if the needle deflects into the red graduation section and it is negative if the needle deflects into the black region.

The two outer scales are used for higher measuring accuracy. For zero adjustment the diaphragm is first of all closed again completely and the zero point is then adjusted by turning of the right hand control knob. In the case of a positive charge use the red scale setting the needle to zero of this scale below on the left. In the case of a negative charge use the outer black scale with zero adjustment on the right.

In the case of only rough measurements it is recommended to use the inner scale of the instrument permitting measurements of the field intensities of surfaces with both positive and negative charges. If it is already known that a surface has a positive or negative charge, precision measurement of the field intensity is possible by using one of the two outer scales offering full deflection angle.

For measurements direct the tube of the Statometer toward the expected location of the charge. The measuring result is a function of the selected measuring range and the distance between charge and Statometer. The Statometer has five meter ranges as follows:

		outer scale	inner scale
dial reading x 1	= measuring range	0 - 60 V/cm	0 - 30 V/cm
dial reading x 2	= measuring range	0 - 120 V/cm	0 - 60 V/cm
dial reading x 10	= measuring range	0 - 600 V/cm	0 - 300 V/cm
dial reading x 100	= measuring range	0 - 6000 V/cm	0 - 3000 V/cm
dial reading x 250	= measuring range	0 - 15000 V/cm	0 - 7500 V/cm

The voltage of the charge of a level surface is then established by multiplying the measured field intensity with the distance in centimeters between the front edge of the tube and the object to be measured. For instance if the graduation mark 50 is indicated on the outer scale in the range x 2 at a distance of 6 cm from a charged level surface, this will result in a field intensity figure of 2 x 50 = 100 V/cm. Since the distance between the tube and object was 6 cm, the surface potential of the object will be 100 x 6 = 600 V.

The instrument will have to be grounded for the measurements. However, as a rule grounding through the human body will be adequate. In special instances the instrument may be grounded at the earthing terminal, as in the case of well insulated flooring or installation on an insulated stand. In the case of very high field intensities it will be advisable to have the instrument grounded for safety reasons.

The currents produced in the ionisation chamber are extremely small - approximately 10^{-15} Amps. Therefore keep instrument off from moisture which might cause leakage leading to errors.

Empty batteries might start corroding and must therefore be removed at once. This also applies to so called "leak proof" cells.

THE TUBE OF THE STATOMETER CONTAINS 10 µC RADIUM AND MUST THEREFORE NEVER BE ENTERED WITH THE FINGER. ALSO DO NOT HOLD YOUR HAND DIRECTLY IN FRONT OF THE TUBE FOR LONGER PERIODS IN ORDER TO AVOID BODILY INJURY! !

Hamburg, May 15, 1959
/m

Description and operating instructions ~~concerning~~ measuring instrument for static electricity

" STATOMETER " System Dr. Haase's

1. Description:

a) Method of application:

The STATOMETER serves for measuring of static electricity with the degree of precision corresponding to the exigencies of service under working conditions. For field intensity measuring in volt/cm 5 meter ranges are adjustable by means of an iris diaphragm arranged at the tube. Thus voltages of 50 volts up to 500.000 volts can be measured and their polarity can be determined in a simple way.

b) Construction:

The instrument consists of a housing 120 x 120 x 90 mm at the front plate of which a tube of 58 mm diameter and a hight of 57 mm is arranged. This tube contains a second conical tube with a hight of 28,6 mm, an upper diameter of 42 mm, and a lower diameter of 26 mm. This tube contains radioactive Ionotron foil.

Inside the casing a valve amplifier is arranged. The turning knobs of two regulators for zero adjusting are situated at the casing underneath the tube. The indicator and two switches are at the opposite side of the instrument. The earthing socket is located between these switches. The handle which contains the batteries for the power supply has a diameter of 45 mm, a length of 150 mm and is arranged inclined below the casing. Weight approx. 1,9 kg batteries included.

c) Principle of measuring:

The radioactive Ionotron foil emits alpha rays ionising the air and thus makes the air electrically conductive. In this way measuring without inertia even of smallest static charges is made possible without touching the carrier of the charge. Indication is done by a measuring instrument via a stable amplifier of an extremely high entrance resistance.

d) Power supply:

Current supply is provided by one 1,5 volt heating battery and two dry batteries of 30 volts each (e.g. Pertrix Nr. 73 which are also being used for medical sound amplifiers). The service life of the batteries covers several hundred working hours.

2. Operating instructions:

The instrument is brought into operation by turning on the left-hand switch below the indicator.

Adjusting of zero-point: Zero-point has to be checked after a short time of preheating and, if required, it has to be readjusted. At first adjustment is made for the "plus"-signed black scale by turning the white ringed regulator. Then the switch will be turned to "minus" position and the zero-point of the red coloured scale is adjusted by means of the red ringed regulator. Considering unknown fields of disturbances this adjustment should be done with closed tube.

The black scale with zero-point left-hand below applies to positive charges, then the right switch is positioned "plus". The red scale with zero-point right-hand above and indication to the left applies to negative charges. The switch must be brought into the "minus" position accordingly.

Selection of the meter ranges is effected by means of an iris diaphragm at the outer tube. The meter range corresponds to the opening of the diaphragm. The desired meter range is adjusted by turning the slider arranged in the guard ring of the iris diaphragm. The factor adjusted must then be multiplied by the indication of the pointer. The following diaphragms are adjustable:

Scale value	x	1	=	meter range	up	to	50 volts/cm
" "	x	2	=	" "	"	"	100 volts/cm
" "	x	10	=	" "	"	"	500 volts/cm
" "	x	100	=	" "	"	"	5000 volts/cm
" "	x	500	=	" "	"	"	25000 volts/cm

When measuring a static charge the instrument is to be directed to the supposed location of the charge. With approximate selection of distance, measuring range and preliminary sign the indicator will show the field intensity in volt/cm.

Scale reading multiplied by distance in cm and multiplied by the factor adjusted at the iris diaphragm determines the tension for static charges on smooth surfaces.

Adequate earthing is necessary in order to secure measuring results. Normally these requirements are met by the human body. In exceptional cases (e.g. insulated floor, insulated tripod) the earthing socket can be used. Working with big field intensities earthing is advisable for safety reasons.

3. Gauging:

Gauging has been done upon a charged, even, and conductive surface of 1 sq.m. at a distance of 2 cm. For special tasks (e.g. single threads) an additional gauging is indispensable if measuring of absolute values is required. This special gauging will be made by us on request. In difficult cases, when reproduction of the charge-carrier in its environment cannot be made easily,

gauging has to take place at the location of operation. Generally there is lesser interest for absolute values rather than the purpose to investigate by what means the amount of static charges can be influenced by suitable actions or conditions. These factors can always reliably be stated by the STATOMETER !

4. Maintenance:

a) Storage:

If possible the STATOMETER should be kept in a dry place, at best in the protection case. If not in use the tube should be shut off by the diaphragm.

b) Active foil:

The active foil inside of the tube should be protected against contamination. When dusting is necessary a soft brush should be used.

THE FOIL MUST NOT BE TOUCHED BY HAND OR TAKEN OUT OF THE TUBE ! DANGER OF RADIOACTIVE INJURIES !

c) Amplifier:

The service life of the valves amounts to several thousand working hours so that under normal conditions a special care is not necessary.

d) Batteries:

Changing batteries is accomplished by screwing off the closing cap at the handle and pulling out the battery frame. Batteries are to be changed when the instrument in "minus" position cannot be adjusted to zero-point any more.

e) General:

Further attendance is superflous. In case that either replacement of the valves or inadequate operation, caused by deficiency or incautious handling, must be taken into consideration it is recommended to return the instrument to our address.

5. Accessories:

1 mono cell 1,5 volt (heating battery)
2 B-batteries at 30 volts each (e.g. Pertrix Nr. 73)
1 protection case (if desired)

6. Statometer Attachments:

The possibilities of application for the STATOMETER have been considerably extended by attachments.

1. Increase of the sensitivity:

By an attachment preparation (attachment I, order no. FM 01/I)

the sensitivity is raised such way that a new scale range for 5 volts/cm at a full amplitude is created. As its essential element the attachment I contains a piece of ionotron foil and is fitted to the head of the tube.

2. Measuring where access is difficult:

Under certain conditions it is frequently necessary to measure static loadings within closed instruments (e.g. in pipes, shafts, drying ovens). For these purposes attachments were developed which solve these problems by means of the STATOMETER.

a) The fundamental idea for the attachments is to transfer the load to be measured by means of probes to a metal disk which is arranged in a certain distance in front of the tube. This disk is fastened with a plexiglass isolation (attachment II, attachment tube with iris diaphragm for connection of probes, order no. FM 01/II). For facilitation of the selection of scale range the usual diaphragms are replaced by an iris diaphragm. The distance of the disk was chosen such way that the gauging of the STATOMETER is also valid in this case.

b) The probe 1 (order no. FM 01/II/1) consists of a plate-like aluminium disk on which a piece of ionotron foil is arranged. If this disk comes near to a loaded body so that the ionotron foil is directed against the body the probe assumes the potential of the body by means of the air ionised by the foil.

c) A ball-probe (probe 2, order no. FM 01/II/2) serves for measuring electric fields and is covered with a ionotron foil. The probe is taken into the field in that way that this is distorted as little as possible.

d) For researches whether and to which extent dust or drop-like bodies are charged in the air (e.g. within spray instruments or in a dust airstream within a shaft) it is advisable to catch the particles which are supposed to be loaded. For this purpose a metalic catching device is needed, the form of which is to be adapted to the local conditions. The device must be taken well isolated into the substance to be measured. From the quantity of the caught substance and the amplitude of the instrument the extent of the charge of the originally dispersed substance can be found out.

e) The energy transmitting from the probes to the attachment tube takes place over connections, the length and the form of which depends on the respective task.

The technical design may be subject to alterations without notice!

Hamburg, February 1957
r/vb/m